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MEMORANDUM

DATE: 19 January 1999

TO: David Bennett, WAM, U.S. EPA, Region X

FROM: Michelle Turner, Chemist, WESTON, Seattle
~~✓nun~~ Roger McGinnis, Senior Environmental Chemist, WESTON, Seattle

SUBJECT: Validation of Polychlorinated Biphenyls (Aroclor) Data
Laboratory Batch: K9806550
Site Duwamish River

WORK ASSIGNMENT NO 46-23-0JZZ

WORK ORDER NO.. 4000-019-038-5200-00

DOC. CONTROL NO : 4000-019-038-AAAK

cc Bruce Woods, RAP-WAM, U.S. EPA, Region X
Dena Hughes, Site Manager, WESTON, Seattle (memo only)
Kevin Mundell-Jackson, Database Management, WESTON, Seattle

The quality assurance review of twenty sediment samples, laboratory batch K9806550, collected from the Duwamish River has been completed. Samples were analyzed for polychlorinated biphenyls as Aroclors using EPA Method 8082 by Columbia Analytical Services of Kelso, Washington. The samples were numbered

98394000	98394001	98394002	98394003	98394004
98394005	98394006	98394007	98394008	98394009
98394010	98394011	98394012	98394013	98394014
98394015	98394016	98394017	98394018	98394019

Data Qualifications

The following comments refer to the laboratory performance in meeting the quality control criteria described in the technical specifications of the laboratory subcontract. The review

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QA Review Batch K9806550 (PCB Aroclors)

Site: Duwamish River

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follows the format described in the *National Functional Guidelines for Organic Data Review* (EPA OSWER Directive 9240 1-05, February 1994).

1. Timeliness

All samples were extracted 31 days after sample collection, exceeding the 14 day holding time criteria in the Sampling and Analysis Plan. However, prior to extraction, samples were stored frozen, thus extending the holding time. Samples were extracted within the 12 month holding time recommended by PSEP for frozen samples.

2. Initial Calibration

a) Mixed Aroclor 1016/1260 Standard

A six point initial calibration was performed. Calibration factors were calculated for a minimum of five peaks, none of which are common to both Aroclors. The calibration factor percent relative standard deviation (%RSD) was less than 20 percent for all peaks used for quantitation.

b) Individual Aroclor Standards

Calibration factors were calculated from a mid-range standard for the other 5 Aroclors using 3 to 5 peaks.

3 Calibration Verification

Aroclor 1016/1260 calibration verification standards were analyzed every 12 hours using a midrange standard. The calibration factor percent difference was less than 25 percent of the initial calibration value

4 Retention Time Windows

Retention Time Windows were calculated from initial calibration. Retention times for calibration verification standards were within established windows

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5 Detection Limits

Instrument detection limits met project required quantitation limits

6. Blanks

a) Laboratory Method Blanks

Laboratory method blank frequency criteria were met.

No target analytes were reported in laboratory method blanks.

b) Field Blanks

No field blanks were associated with this laboratory batch.

7 System Monitoring Compounds (Surrogates)

Surrogate compound percent recovery met quality control criteria for all samples.

8. Matrix Spike and Matrix Spike Duplicate

All matrix spike (MS), matrix spike duplicate (MSD) and relative percent difference (RPD) results were within QC limits.

9. Laboratory Control Sample (LCS) Analysis

LCS recovery goals for Aroclors were established in the project Sampling and Analysis Plan at 70 to 130% for sediment. Based on conversations with the laboratory, historical control chart limits of 26 – 142 for Aroclor 1016 and 40-139 for Aroclor 1260 were also used for data qualification.

All LCS percent recoveries met QC guidelines

10. Field Duplicate Analysis

No field duplicates were associated with this SDG.

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QA Review Batch K9806550 (PCB Aroclors)

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11. Second Column Confirmation

The Relative Percent Difference (RPD) in reported analyte concentration was less than 35 percent for the primary and confirmation column for all samples except:

Sample Number	Compound	DB-5 Conc	DB-1701 Conc	% Diff
98394010	Aroclor 1254	101.8	147.9	37
98394011	Aroclor 1254	417.4	617.7	39
98394012	Aroclor 1254	171.8	253.5	38
98394017	Aroclor 1254	14.7	58.4	120

Differences can arise from analytical interferences on one column. However, the percent differences are not deemed significant at the reported concentrations. The lower concentration was reported for each analyte.

12 Sample Analysis

A cursory review of raw data was performed. All laboratory deliverables were present and complete. A duplicate analysis was performed on 98394010; all RPDs were less than 35 percent. The case narrative verified that samples were stored frozen until extraction. No complications were noted in the case narrative.

13. Laboratory Contact

No laboratory contact was required

Data Assessment

Upon consideration of the data qualifications noted above, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

U - The compound was analyzed for, but was not detected.

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QA Review Batch K9806550 (PCB Aroclors)

Site. Duwamish River

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- UJ - The compound was analyzed for, but was not detected. The associated quantitation limit is an estimate because quality control criteria were not met.
- J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported are less than CRDL or lowest calibration standard.
- R - Quality control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.
- N - Presumptive evidence of presence of material (tentative identification).
- I - Elevated reporting limit due to matrix interference

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DCN 4000-019-038-AAAK

19 January 1999
Region X

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806550
Date Collected: 9/21/98
Date Received: 9/22/98

Polychlorinated Biphenyls (PCBs)

Sample Name	98394000	Units	ug/Kg (ppb)
Lab Code	K9806550-001	Basis	Dry
Test Notes			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Notes
Aroclor 1016	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1221	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1232	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1242	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1248	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1254	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1260	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	

Approved By E. Wiigek
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Date 11/13/118
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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806550
Date Collected: 9/21/98
Date Received: 9/22/98

Polychlorinated Biphenyls (PCBs)

Sample Name	98394001	Units	ug/Kg (ppb)
Lab Code	K9806550-002	Basis	Dry
Test Notes			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1221	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1232	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1242	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1248	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1254	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1260	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	

Approved By E. W. Gaylord Date 11/13/98
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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806550
Date Collected: 9/21/98
Date Received: 9/22/98

Polychlorinated Biphenyls (PCBs)

Sample Name	98394002	Units	ug/Kg (ppb)
Lab Code	K9806550-003	Basis	Dry
Test Notes			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1221	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1232	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1242	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	34	
Aroclor 1248	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1254	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	140	
Aroclor 1260	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	70	

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Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806550
Date Collected: 9/21/98
Date Received: 9/22/98

Polychlorinated Biphenyls (PCBs)

Sample Name	98394003	Units	ug/Kg (ppb)
Lab Code	K9806550-004	Basis	Dry
Test Notes			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Notes
Aroclor 1016	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	-
Aroclor 1221	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	-
Aroclor 1232	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	-
Aroclor 1242	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	44	-
Aroclor 1248	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	-
Aroclor 1254	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	178	-
Aroclor 1260	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	112	-

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S. Wiegert

Date 11/13/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806550
Date Collected: 9/21/98
Date Received: 9/22/98

Polychlorinated Biphenyls (PCBs)

Sample Name	98394004	Units	ug/Kg (ppb)
Lab Code	K9806550-005	Basis	Dry
Test Notes			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Notes
Aroclor 1016	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1221	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1232	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1242	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1248	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1254	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	39	
Aroclor 1260	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	22	

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*L. Winger*Date 11/13/98*WPT 1/9/99*

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Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806550
Date Collected: 9/21/98
Date Received: 9/22/98

Polychlorinated Biphenyls (PCBs)

Sample Name	98394005	Units	ug/Kg (ppb)
Lab Code	K9806550-006	Basis	Dry
Test Notes			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1221	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1232	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1242	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1248	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1254	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1260	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806550
Date Collected: 9/21/98
Date Received: 9/22/98

Polychlorinated Biphenyls (PCBs)

Sample Name	98394006	Units	ug/Kg (ppb)
Lab Code	K9806550-007	Basis	Dry
Test Notes			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1221	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1232	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1242	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1248	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1254	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1260	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806550
Date Collected: 9/21/98
Date Received: 9/22/98

Polychlorinated Biphenyls (PCBs)

Sample Name	98394007	Units	ug/Kg (ppb)
Lab Code	K9806550-008	Basis	Dry
Test Notes			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Notes
Aroclor 1016	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1221	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1232	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1242	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1248	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1254	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1260	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806550
Date Collected: 9/21/98
Date Received: 9/22/98

Polychlorinated Biphenyls (PCBs)

Sample Name	98394008	Units	ug/Kg (ppb)
Lab Code	K9806550-009	Basis	Dry
Test Notes			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1221	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1232	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1242	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	25	
Aroclor 1248	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1254	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	145	
Aroclor 1260	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	82	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806550
Date Collected: 9/21/98
Date Received: 9/22/98

Polychlorinated Biphenyls (PCBs)

Sample Name	98394009	Units	ug/Kg (ppb)
Lab Code	K9806550-010	Basis	Dry
Test Notes			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	0.1	1	10/22/98	11/6/98	ND	
Aroclor 1221	EPA 3550B	8082	0.1	1	10/22/98	11/6/98	ND	
Aroclor 1232	EPA 3550B	8082	0.1	1	10/22/98	11/6/98	ND	
Aroclor 1242	EPA 3550B	8082	0.1	1	10/22/98	11/6/98	68	
Aroclor 1248	EPA 3550B	8082	0.1	1	10/22/98	11/6/98	ND	
Aroclor 1254	EPA 3550B	8082	0.1	1	10/22/98	11/6/98	451	
Aroclor 1260	EPA 3550B	8082	0.1	1	10/22/98	11/6/98	234	

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*N. Wiegel*Date 11/13/98*NOT 14/99*00059
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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806550
Date Collected: 9/21/98
Date Received: 9/22/98

Polychlorinated Biphenyls (PCBs)

Sample Name	98394010	Units	ug/Kg (ppb)
Lab Code	K9806550-011	Basis	Dry
Test Notes			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1221	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1232	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1242	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	40	
Aroclor 1248	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1254	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	148	
Aroclor 1260	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	98	

Approved By S. Wiegel Date 11/13/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806550
Date Collected: 9/21/98
Date Received: 9/22/98

Polychlorinated Biphenyls (PCBs)

Sample Name	98394011	Units	ug/Kg (ppb)
Lab Code	K9806550-012	Basis	Dry
Test Notes			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1221	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1232	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1242	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	83	
Aroclor 1248	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	ND	
Aroclor 1254	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	618	
Aroclor 1260	EPA 3550B	8082	0 1	1	10/22/98	11/6/98	453	

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L. Wiegel

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806550
Date Collected: 9/22/98
Date Received: 9/23/98

Polychlorinated Biphenyls (PCBs)

Sample Name	98394012	Units ug/Kg (ppb)
Lab Code	K9806550-013	Basis Dry
Test Notes		

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1221	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1232	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1242	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	82	
Aroclor 1248	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1254	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	254	
Aroclor 1260	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	192	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806550
Date Collected: 9/22/98
Date Received: 9/23/98

Polychlorinated Biphenyls (PCBs)

Sample Name	98394013	Units	ug/Kg (ppb)
Lab Code	K9806550-014	Basis	Dry
Test Notes			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1221	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1232	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1242	EPA 3550B	8082	1	10	10/22/98	11/7/98	2500	
Aroclor 1248	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1254	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	1100	
Aroclor 1260	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	443	

Approved By S. M. Segal Date 11/13/98 *WGT/14/98*

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806550
Date Collected: 9/22/98
Date Received: 9/23/98

Polychlorinated Biphenyls (PCBs)

Sample Name	98394014	Units	ug/Kg (ppb)
Lab Code	K9806550-015	Basis	Dry
Test Notes			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
- Aroclor 1016	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1221	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1232	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1242	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	170	
Aroclor 1248	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1254	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	373	
Aroclor 1260	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	214	

Approved By 2. W. Wiegert Date 11/13/98
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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806550
Date Collected: 9/22/98
Date Received: 9/23/98

Polychlorinated Biphenyls (PCBs)

Sample Name	98394015	Units	ug/Kg (ppb)
Lab Code	K9806550-016	Basis	Dry
Test Notes			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1221	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1232	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1242	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	635	
Aroclor 1248	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1254	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	594	
Aroclor 1260	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	379	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806550
Date Collected: 9/22/98
Date Received: 9/23/98

Polychlorinated Biphenyls (PCBs)

Sample Name	98394016	Units	ug/Kg (ppb)
Lab Code	K9806550-017	Basis	Dry
Test Notes			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1221	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1232	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1242	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	70	
Aroclor 1248	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1254	EPA 3550B	8082	1	10	10/22/98	11/10/98	2200	
Aroclor 1260	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	309	

Approved By

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*Z. Wiegel*Date 11/13/9800066
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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806550
Date Collected: 9/22/98
Date Received: 9/23/98

Polychlorinated Biphenyls (PCBs)

Sample Name	98394017	Units	ug/Kg (ppb)
Lab Code	K9806550-018	Basis	Dry
Test Notes			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1221	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1232	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1242	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1248	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1254	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	58	
Aroclor 1260	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	39	

Approved By L. Wiegert Date 11/13/98

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806550
Date Collected: 9/22/98
Date Received: 9/23/98

Polychlorinated Biphenyls (PCBs)

Sample Name	98394018	Units	ug/Kg (ppb)
Lab Code	K9806550-019	Basis	Dry
Test Notes			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1221	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1232	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1242	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	22	
Aroclor 1248	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1254	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	114	
Aroclor 1260	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	74	

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Roy F Weston, Inc
Project: Duwamish River/4000-027-001-2019-38
Sample Matrix: Sediment

Service Request: K9806550
Date Collected: 9/22/98
Date Received: 9/23/98

Polychlorinated Biphenyls (PCBs)

Sample Name	98394019	Units	ug/Kg (ppb)
Lab Code	K9806550-020	Basis	Dry
Test Notes			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Aroclor 1016	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1221	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1232	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1242	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1248	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	
Aroclor 1254	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	37	
Aroclor 1260	EPA 3550B	8082	0 1	1	10/22/98	11/7/98	ND	

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